# Filthy flourishing

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## Para-Sites, Animal Infrastructure, and the Waste Frontier in Kampala

by Jacob Doherty

Thousands of marabou storks occupy Kampala, nesting in the city's green spaces and eating up to 2 kilos of organic matter daily, mostly rotting garbage found in the city's open dumps. Weedy birds, they flourish amid Kampala's garbage crisis. Storks are both waste infrastructure and waste themselves, rendered disposable by the same state-centric views of infrastructure that make informal waste pickers precarious, and cast out from the imaginary of a clean, green, urban future. Theorizing animal and informal infrastructures together as "para-sites," this paper follows marabou storks through Kampala's ever-shifting waste frontier: the postconsumer equivalent to the extractive frontier that subtends the capitalist fantasy of endless growth. Kampala's topography, hydrology, and class structure ensure that trash flows downhill, accumulating in slums where it leads to flooding and outbreaks of cholera, typhoid, and other waterborne illnesses as well as to endemic malaria. Waste with wings, marabou storks remake the urban waste landscape, undermining efforts to stabilize the city's ultimate sinks in landfills, slums, and wetlands as they flourish in filth and defecate in the heart of greenness.

In his series *Midway*, photographer Chris Jordan shows dead and dying albatrosses with bellies full of disposable plastics from the Pacific garbage patch.[1] An elegy for nature, these images illustrate the slow interspecies violence of the Anthropocene. I was reminded of Jordan's images walking across the campus of Makerere University one afternoon in 2013. In the shade of one of the many trees that make Makerere an oasis of cool and green in the bustling city, I smelled and then saw a carcass on the ground, and 20 meters later, at the foot of another tree, another. The carcasses were marabou storks (*kaloli* in Luganda), enormous birds reaching up to one and one-half meters tall and weighing 9 kilos that roost in the campus's trees, soar through the city skies, and roam its dump sites.

Marabou storks have a nightmarish, insect-like charisma (Lorimer 2015:35–55). While their size and upright stature invite anthropomorphism, this possibility is undermined by their sheer alterity—ungainly proportions, a robotic gait, the protruding fleshy air sac dangling beneath their foot-long beaks. Bizarrely other, yet somewhat familiar, these are uncanny creatures with monstrous faces who, in the course of Kampala life, lack "face"—the Levinasian ability to elicit an ethical response. Moreover, they themselves are largely unmoved by immediate human presence, content to walk and wander along roadsides and busy sidewalks or amid the comings and goings of dump trucks at the municipal landfill. Like Jordan's albatrosses, marabou storks are trash eaters. Unlike the Midway birds, they are flourishing, feasting on the city's filth. Marabou storks are weedy creatures (Tsing 2005:174–176), unplanned inhabitants making the most of marginal anthropogenic patches. However, the carcasses on campus are evidence of the ambivalence of the socioecological niche that these creatures occupy. They died not because of pollution but as pollution (fig. 1).

This paper examines the material and ideological infrastructures that enact marabou storks as pollution, situating these carcasses within the changing contours of animal and human belonging in contemporary Kampala. Learning from storks, and following them through the city's wastelands, I track the patchy ecologies and economies that sustain the municipal waste stream, theorizing these patches as "para-sites": spaces of heterogeneity that exceed the best-laid plans of municipal waste managers and give rise to new waste frontiers. In doing so, I illustrate the sheer amount of work that goes into the construction and maintenance of sociotechnical systems. In addition to being accumulations of capital, dead labor in the Marxist sense, infrastructures are also vitally constituted by living human and more-than-human labor (Fredericks 2014; Reno 2015). The aim here is to understand urban infrastructures as multispecies workplaces, constituted through the dynamics of simplification and proliferation characteristic of the patchy Anthropocene (Tsing, Mathews, and Bubandt 2019). I argue that storks are both waste infrastructure and waste themselves, rendered disposable by the same state-centric views of infrastructure that make informal waste pickers precarious,

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1. Jordan's Midway photographs are available at http://www.chrisjordan.com/gallery/midway/.

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Figure 1. Marabou storks dead on a campus lawn (*left*) and roosting on a rooftop near Makerere University (*right*). (Photos by Jacob Doherty.)

cast out from the imaginary of a clean, green, urban future. While never fully completing its projects, the modernizing municipal imaginary enacts a multispecies form of infrastructural violence: a series of violent simplifications that undercut the ability to recognize and respond to the multiple forms of infrastructure that constitute the city.[2]

## Para-Sites

Contemporary Kampala is undergoing a dramatic process of techno-political transformation, as the Kampala Capital City Authority (KCCA) embarks on an ambitious program to transform urban governance, improve infrastructure, regulate the informal economy, and bring order to a city they approach as chaotic and unruly. Waste is at the center of this contested transformation, a process of urban ordering widely resented and resisted by many participants in the informal economy, residents of the city's slums, workers in the transportation industry, and populist politicians. The KCCA's first priority after its formation in 2011 was tackling Kampala's waste crisis, founding its authority on promises of a clean and green future and relying on sustainability discourse to manage the contradictions between economic development, urban growth, and environmental degradation. Rationalizing waste management—through a combination of standard-issue international like public-private partnerships, along with municipal investments in new equipment, and experiments in neighborhood "self-loading" techniques—emerged as a way to try to stamp the KCCA's authority on urban space that was becoming increasingly politically ungovernable (Doherty 2019). The KCCA's aim was to take full control of the waste stream to increase collection rates from 40% and, in so doing, demonstrate the efficacy of a new regime of technocratic authority.

Kampala's new official waste stream is predicated on the idea of "away," on the fantasy of disposability. Municipal policy seeks to move waste from source to sink via sealed streams, handled by authorized municipal workers or licensed private companies. This waste stream is no easy achievement; it takes work. This work is widely distributed in space, time, and species, extending from the everyday intimate practices of domestic waste disposal to capital-intensive mechanized weekly collections. The spills from this stream—such as the filthy feasts that sustain marabou stork colonies or municipal loaders' illicit access to recyclable materials sorted and separated inside trash trucks and sold en route to the landfill—are not simply unofficial

2. Infrastructural violence refers to the interconnected ways that infrastructures participate in slow and structural, as well as more traditionally conceived, forms of violence (Rodgers and O'Neill 2012). First, infrastructures are targets of violence, as in the case of bombings targeting train stations (Rao 2007) or US missile strikes on Syrian airstrips. Second, infrastructures can be the means by which structural violence takes place, be it through forms of explicit exclusion, as in the famous example of Robert Moses's bridges designed to keep public buses and thus black and low-income New Yorkers from accessing public recreational facilities (Winner 1980); the planning of hazardous and unwelcome infrastructures like incinerators; or the uneven provision of services like water, electricity, and sewerage. Third, infrastructural violence refers to the forms of displacement that occur when informal infrastructures are criminalized (Doherty 2017). As with the concepts of structural and slow violence, infrastructural violence emphasizes the ways in which these forms of violence rarely constitute events and become naturalized background conditions of everyday life. The concept offers added emphasis on the materiality of these processes and their complex imbrication in forms of planning, regulation, privatization, and normative narratives of urban life and urban futures.

deviations but vital para-sites that sustain and subsidize the official waste stream.[3]

Rather than expose the fantasy of "away" as a falsehood, my aim here is to explore the worlds it constitutes. Building on Michel Serres (2007), I identify these worlds as para-sites: "sites" in order to emphasize the importance of space and location, although these are also often spatially diffuse practices rather than stable locations, and "para" in order to emphasize the relation of proximity, of being beside. As Eve Sedgwick notes, "beside" is a helpful alternative to the linearity and assumed hierarchies of dualistic prepositions such as above/below or ahead/behind, prepositions that "turn from spatial descriptions into implicit narratives of, respectively, origin and telos" (2003:8). In this way para-sites offer a useful way of thinking about infrastructures, be they material, human, or animal. Rather than uncovering a hidden world below, positing a sturdy material base upon which an ideological superstructure is erected, or signaling residual practices bound to give way under the weight of modernization, thinking through para-sites brings into focus the multiple world-making projects that take shape alongside one another, albeit in unevenly valued and violently inegalitarian ways.[4] As spatial fragments made in relation to other sites (Tsing, Mathews, and Bubandt 2019), para-sites reveal the patchiness of urban infrastructures and economies. Para-sites are contact zones that exist with and alongside mainstreams, although hardly on equal terms, facilitating flows while diverting materials toward unanticipated ends. Rather than a category of place or person, however, para-sites should be understood as a mode of relation.

The term "para-site" has other resonances, of course. "Parasite" can refer to organisms that sustain themselves at the expense of a host, or to individuals who rely upon others and offer nothing in return. These biological and social definitions have great everyday currency in Uganda. The term "parasite" was available for my interlocutors in Kampala in this conventional sense to label middlemen and traders seen to be exploiting the labor of impoverished others. Long before Idi Amin's "war of economic liberation" and the 1972 decree expelling them, this rhetoric was also used to demonize Ugandan Asians, framing accusations that Asian traders were a parasitic, foreign, and disloyal community engaged in economic malpractice, blocking African economic advancement, and exploiting the African peasantry (Kasozi 1994).[5] Similarly xenophobic rhetoric has recurred recently in Kampala in "environmentalist" protests against a proposal to give parts of Mabira Forest to a Ugandan-Asian family to develop into sugar plantations (Cole 2013).

To be clear, this is not the sense I mean when I label spaces, species, and practices like recycling kiosks, informal waste collection, dump sites, and marabou stork ecologies as para-sites. On the contrary, the aim of this essay is to illustrate the constitutive ambiguities of para-sites. Parasitism is not strictly pathological but both relational and relative: who is para-siting whom is never stable. Recent work in microbiology shows that the difference between parasitic and mutualistic relationships is far from clear-cut and can, in fact, change dramatically over the life-course of parasites and hosts (Hird 2009; Paxson and Helmreich 2013).[6] Responding to this understanding of parasitism, mutualism, and symbiosis requires moving from an essentialist to a relational and ecological view of multispecies intra-actions, from seeking to eradicate parasites to learning to live with them.

This relational approach to parasites offers a way to understand the relationships between so-called formal and informal urban infrastructures. While contemporary policy discussions frame the informal as a discrete, autonomous economic sector (Roy and Al Sayyad 2004), Keith Hart's (1973) original formulation emphasizes both the practical entanglement of informal activities with official economies (in practices such as underpaid government officials moonlighting, e.g.) as well as the ways informality as a concept emerges as a residual category of official modes of knowledge production unable to see or statistically capture work outside of the wage relation. As many ethnographic descriptions have shown in years since, informal

3. Systems of circulation and production like waste management work because of, not in spite of, rule bending. James Scott's (1998) description of work-to-rule strikes in which taxi drivers carry out their duties exactly by the book, forgoing the informal practices that expedite circulation and, in so doing, paralyzing traffic, illustrates the importance of extralegal activity to the functioning of modernist systems. For Scott, this exemplifies a broader point that modernist planners are ideologically biased against seeing and accounting for the informal practices that enable systems to work and, in a quest to purify systems of this polluting dirt, produce unworkable plans doomed to failure.

4. In this sense, para-sites are Derridean supplements: "necessary supports, which are the conditions of possibility of any system of knowledge, but dangerous to it because they subvert its explanatory power and sovereign claims to self-adequacy" (Gidwani 2008:147; discussing Derrida 1988:17).

5. Raffles (2007) and Mamdani (2001) have examined the ways in which comparisons to parasitic insects rhetorically construct exterminable others in the context of the Holocaust and the Rwandan genocide, respectively. The rhetoric of the economic parasite also bears the imprint of a misogynistic bias contrasting "true" productive activity with "mere" reproductive or distributive activity (Ferguson 2015), while nonreproductive queer sexualities have also been violently pathologized as parasitic (Ahuja 2015).

6. Work on the human microbiome, e.g., highlights the importance to human health of a range of microbes once considered parasitic (Benezra, DeStefano, and Gordon 2012). This view reframes disease not as the simple presence of injurious parasites but "as the emergent outcome of complex spatio-temporal interactions between the host immune system and the internal and external microbial environment" (Lorimer 2017:1). Here species give way to intensities as objects of concern. Parasitic pathology is an effect of the intensification and densification of production in plantation ecologies such as those described in this issue for fowl, coffee, and salmon by Frédéric Keck (2019), Ivette Perfecto, M. Estelí Jiménez-Soto, and John Vandermeer (2019), and Heather Swanson (2019), respectively. In addition to this functional dynamic, relationships between parasites and hosts also drive evolutionary dynamics (Brunner et al. 2017), giving rise, e.g., to extravagant displays like peacock feathers (Zimmer 2000).

economies and infrastructures are not only not discrete sectors but are often vital to the operation of privileged official forms of production and, as in this case, disposal circulation (Meagher 2010; Simone 2004). Moreover, they do not, in fact, lack "form," but they manifest consistent patterns of labor recruitment, organization, and surplus distribution (Guyer 2016; Roitman 2005). While this ethnographic literature has been focused almost exclusively on human economic activity, understanding these practices as para-sites emphasizes not only their relational entanglement with mainstream economies and their active relegation to a secondary status but also the more-than-human composition of these worlds. This is vital for understanding how urban infrastructures work and how they are embedded in and constitutive of patchy urban ecologies, "mosaics of difference" structured by ongoing dynamics of simplification and proliferation (Tsing, Mathews, and Bubandt 2019).

In Kampala, the formal waste collection sector (both public and private) is parasitic on the informal recycling trade, for example, through loaders' ability to supplement their meager wages with a second source of income they can earn from sorting through the waste they collect in the course of doing their formal work. This work, in turn, benefits from the waste removal that marabou storks perform as they eat their way through the city's garbage. In their messiness, the waste stream and its para-sites neatly illustrate the incomplete, multiple, and materially heterogeneous nature of urban infrastructure and the disorderly instabilities through which Kampala's waste landscapes are sedimented. Because the waste stream often depends on, rather than precedes, its para-sites, the hierarchy present between a mainstream and its para-sites should be understood as an effect of material practices of marginalization rather than as an essential feature of the para-site. Just as research on the microbiome and its parasites requires global health practitioners to rethink the antimicrobial essentialism of public health (Lorimer 2017), understanding the dynamics of para-sites should prompt city planners to reconsider the baseline "engineering" (Viveiros de Castro 2019) preference for violent simplifications in the urban Anthropocene.

## Animal Infrastructure

Not just symbolic figures of thought or objects of biopolitical environmental interventions, marabou storks are lively participants in the city's waste stream, coworkers in urban infrastructure. Nor are marabou storks domesticated creatures gone feral. They are uninvited guests who have given up their continent-spanning migration to settle in the city, adapting their ecologies to take advantage of the filthy feast available to them. One of the few species able to adapt to urban life, marabous' flourishing marks a loss of biodiversity and comes at the expense of other smaller species with more specific diets or habitat requirements (Chamberlain et al. 2017). As recent migrants, *kaloli* do not appear as totems for any of the 52 Ganda clans, nor do they appear in Ganda folklore or proverbs. While rumors link the birds' presence in the city to the darkest days of the Amin years, when they are said to have come to town to feast on human bodies left in the street, biologists Derek Pomeroy and Michael Kibuule's (2017) study of the population shows that marabou stork numbers grew most dramatically in the 1990s. The first marabou stork nests were observed on what was then the outskirts of Kampala in 1970 (Pomeroy and Asasira 2011). By 2016, over 1,200 nests existed in Kampala, predominately on the leafy campus of Makerere University. While the rumors do not accurately describe the storks' population biology, they do speak to their capacity to discursively register moments of social and landscape upheaval. The end of a long guerilla war that devastated central Uganda, the implementation of Structural Adjustment, and the establishment of a new constitution in the 1990s meant population and economic growth in Kampala, giving rise to a flourishing informal economy, the emergence of new peri-urban slums and elite suburbs, and the transformation of the city's ecology. The growing availability of organic wastes meant a constant food supply, so stork colonies could expand, and patterns of seasonal migration gave way to a permanent urban presence in the city, with an expanded breeding season no longer coupled tightly to the change from wet to dry seasons (Pomeroy and Kibuule 2017).

Even as they are dismissed and despised as polluting dirty birds, marabou storks play a vital, but unrecognized, role in managing the city's waste. Based on annual counts, there are, at a conservative estimate, 3,500 marabou storks in Kampala.[7] Each stork eats 2 kilos of organic waste daily. Collectively, that amounts to 7 metric tons a day, 210 tons a month, approximately 3% of the municipal solid waste generated in the city. By way of comparison, the formal private waste collection sector together collects 14%, the municipal government 26%. As important as how much they eat, what storks eat is crucial for understanding their contribution to the city's waste management infrastructure. Kampala's waste stream is 92% organic matter: heavy and wet, it is unsuitable for incineration and overwhelms the city's capacity for composting (Komakech et al. 2014). While the composition of the waste stream varies from neighborhood to neighborhood, with wealthier areas generating less organic waste overall, the most significant forms of municipal waste (by weight) come from food: the peels of matooke and other staple starches, banana leaves and other plant-based forms of packaging used to cook and transport foods, as well as rotten meat and butchering scraps. These organic wastes are the staple of the marabou storks' diet. By eating them, they not only remove them from the waste stream to be managed by the KCCA, but they reduce the amount of rotting matter that could carry threatening pathogens (Ssemmanda and Pomeroy 2010:27).

For the municipality, "away" is Kiteezi Landfill. Like landfills everywhere, Kiteezi is a multispecies landscape (Hoag, Bertoni, and Bubandt 2018). Storks' infrastructural contributions are

7. Derek Pomeroy, personal communication, 2017. Other estimates reported in the Kampala media put the numbers as high as 10,000 and 20,000.

especially visible at Kiteezi, where nearly 1,000 gather daily to pick through the rubbish dumped by the city's fleet of public and private waste collectors. Along with storks and vultures, unknown billions of microbes are also at work, breaking down biodegradable waste to produce methane and other gases that the KCCA seeks to tap as an energy source.

These are not the only salvagers at work at Kiteezi. Despite a municipal ordinance prohibiting scavenging, hundreds of people work illicitly at Kiteezi salvaging recyclables, removing plastics, paper, glass, metal, and other scrap materials, sorting them according to the categories introduced by the formal recycling industry, saving them at mobile on-site locations, and selling them by the kilo to off-site traders who sell them by the ton to investors who shred, melt, reuse, or export the recycled materials. Salvagers, predominantly but far from exclusively, men, range in age from 18 to 70 years and come from all over Uganda, primarily from nearby job-poor rural districts. They can earn from $2 to $15 a day, "depending on energy," in the words of Faith Kadimala, who had been working at Kiteezi for 20 years.

Except for one young man who had once been struck in the eye by a wing, salvagers I met while conducting interviews at the landfill did not mind working alongside marabou storks. "They eat their things, they don't bother us," said a salvager who had recently begun to work at Kiteezi. Another worker observed that birds "don't have any problem with us because we all earn from this place," identifying the landfill as a productive multispecies contact zone (Haraway 2008:216–220), a marginal ecology where diverse forms of life could sustain themselves. Indeed, as one experienced older salvager explained to me, storks "pick those smelly things and eat them, rotten mangos, rotten meat, whatever. They can help us." By removing the smelly organic matter from the surface of the landfill, storks ease the burden on the salvagers, making recyclable materials more apparent and graspable, improving the sensory experience of salvaging. The multispecies labor at Kiteezi models a biodiverse form of civility, ranging from muted hostility to tolerance to acknowledged cooperation. Civility here entails politely getting on with the job at hand, regardless of difference. It does not entail anything as impolite as challenging the structures of power that shape the course of the waste stream, the composition of the waste-work labor force, or the unevenly distributed exposures to toxicity. Indeed, civility is often central to facilitating the reproduction of structural violence. As Tobias Kelly and Sharika Thiranigama (2017) observe, "civility can be deeply enmeshed in forms of exclusion. What counts as civil behavior has historically favored white, bourgeois, male, and heterosexual ways of being in the world" (n.p.). In this light, it is important to qualify the significance of this more-than-human civility and to question how civility might become solidarity (fig. 2).

Together, this multispecies salvaging work removes over a ton of waste from the landfill on a daily basis (Mugaga 2006), extending the life of the already over-full infrastructure. This service exemplifies the instability of the para-sitic relation—

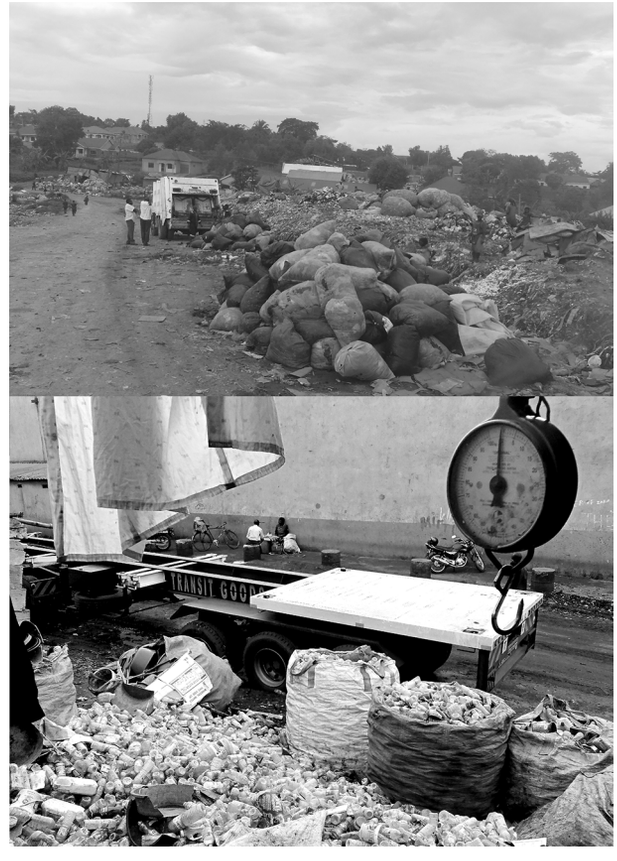

Figure 2. Para-sites. A network of informal practices of gathering and recycling plastic bottles and other materials exists alongside Kampala's formal waste management systems, including sorted plastics set aside at Kiteezi Landfill (*above*) and a broker dealing in plastic bottles in an industrial area (*below*). (Photos by Jacob Doherty.)

who is para-siting whom in this case? Salvagers point to this fact and to the proliferation of kiosks and other businesses around the site to show that they are contributing to the development of the city, that their informal, technically illegal but tacitly sanctioned, labor matters and should not be displaced by pending privatization of the landfill. Despite their contribution, salvagers were not officially recognized by the municipality. Salvagers were registered, but this registration was initiated by their own chairman and did not entail any benefits other than limiting the number of salvagers.[8] Salvagers were allowed to store their collections in nonactive areas of the landfill and to use a small tap at the edge of the site to clean themselves, but neither they nor the site managers could construct any structures that would imply permanence. To improve their

8. In October 2014, 423 salvagers were registered to work at Kiteezi. Since at least 2013, workers at Kiteezi have been discussing rumors about privatization. The landfill was maybe going to be tendered to a private company to manage. This, many feared, would mean they would be evicted from the site and replaced by a labor force they assumed would be connected by kinship or ethnicity to whoever won the contract.

conditions, several salvagers said they would like the government or an NGO to support them by buying them the machinery needed to shred plastic so they could, in the hegemonic development parlance of the city, "add value" to their materials, moving up the commodity chain themselves instead of making money for traders and foreign investors. To officially recognize the salvagers would be to officially recognize that the municipality was breaking its own laws and exposing workers to the dangerous matter of the waste stream, potentially exposing the municipal government, in turn, to liability and responsibility.

This uneasy relationship of nonrecognition—constituted by mutual implication in illegality, pending displacement, and vague promises of relocation—exemplifies the logic and practice of the para-site. The economy of salvage at Kiteezi is not adequately described as either formal or informal. It is, technically, illegal, but it is nonetheless central to the provision of both municipal and private waste collection services. Salvagers do not have bosses and enjoy much control over the rhythms of their work, but they have little control over the material conditions of that work or the prices they are paid. Their work requires little to no capital to enter but produces value captured by large-scale foreign investors. Plastic exporters and the municipal government benefit from this work without seeking to control it, profiting from the nonstandardization of modes of economic and ecological production (Tsing 2009). This economy generates shame and stigma but also incomes that sustain social reproduction in ways that can override moral and affective marginalization. In the words of a middle-aged salvager at Kiteezi, rejecting the idea that he should be ashamed of working in trash, "People can say what they want, but when they see what I have earned, they cannot say anything!"

As Kiteezi Landfill approaches closure, the KCCA is soliciting investors looking to capture methane from the waste while seeking out new sites to enact as away. While storks will surely relocate to this new location, the future for salvagers is less certain. Nonetheless, two young men salvaging at Kiteezi identified with the birds, protesting their treatment by the municipal government by claiming that "the KCCA minds less about us, they look at us as those birds. They have never called to us to talk about any vital thing, which I think is improper." Storks offered a figure through which they could express their own sense of the impossibility of municipal recognition for their work and the unfairness of their silencing in the face of pending displacement. To be treated like a stork was to be ignored, barely tolerated, and deemed fundamentally incapable of exerting a moral obligation on others. As the waste frontier closes in Kiteezi, the patchy ecologies and economies it sustains move on. While municipal landfills are privileged as the state-sanctioned waste frontiers, they are not the only ones.

## Waste Frontiers

Waste frontiers are a form of resource frontier—the resource in question is away itself. Resource frontiers, as Anna Tsing (2003) theorizes them, are material processes and cultural projects located at the edges (often, but not exclusively, geographical) of capitalism that constitute landscapes, environments, and materials as resource. Waste frontiers take place through the location and construction of new forms of away. They are multiscalar, opening new landscapes, environments, species, and bodies to toxicity and dumping. As resource frontiers, waste frontiers are critical sites for managing the crises of capitalism (Moore 2015:73).[9] They are internalized-outsides and externalized-insides that temporally displace the limits of accumulation by locating new sources of value (unpaid work, untapped minerals, unexploited soils) and new sacrifice zones in which to dump negative values (industrial debris, toxic byproducts, greenhouse gases). If resource frontiers are typically conceptualized as modes of incorporation into capitalism, waste frontiers are modes of managing exclusion. In both cases, the temporality is "not yet" (Tsing 2003:5100), as frontiers are ephemeral and constantly shifting because naturalized resources, including away, are exhausted and dumps overflow.

Jason Moore asserts that "the end of cheap garbage may loom larger than the end of cheap resources" (2015:305), arguing that climate change can be understood as a crisis of a closing waste frontier, the coming due of unpaid debts accrued over 2 centuries of dumping waste carbon into the atmosphere. The Pacific garbage patch—fatal to the albatrosses of Midway Island—likewise materializes the closing of the ocean as a waste frontier. Throughout the history of capitalism, the costs of wasting have been consistently externalized, relocated off the books of capitalist firms onto those of unevenly exposed publics and into the bodies and environments of indigenous, colonized, and racialized populations. However, it would be inaccurate to consider these simply as the end point of a linear process that follows the commodity chain pattern of extraction, manufacturing, distribution, consumption, and disposal. A linear view begins with resource frontiers seeking to appropriate value and leads on to exhaustion, devastation, and the emergence of wastelands. As Traci Voyles (2015) illustrates, however, settler colonial extractive frontiers often begin with the cultural project of wastelanding, the devaluation of lands and livelihoods as unproductive in order to pave the way for resource frontiers that culminate in the material wastelanding—

9. In different ways, Moore and Tsing extend a genealogy of Marxist thought on frontier dynamics extending to Rosa Luxemburg's (2003) work on imperialism's centrality to capitalist modes of production, through David Harvey's (2004) argument that primitive accumulation is not an original sin no longer present in contemporary capitalism but an ongoing process of accumulation by dispossession, and J. K. Gibson-Graham's (2006) feminist geography of capitalism's constitutive dependencies on noncapitalist forms of social life (see also Gidwani and Wainwright [2014] on Kalyan Sanyal's theorization of the "capital-not-capital complex"). Waste frontiers reveal that these dynamics are present not only during exploration, extraction, and production where "not-yet" capitalist spaces are appropriated, but also during disposal, when "no-longer" capitalist spaces are produced.

the displacement of native populations and the destruction of the dynamic landscapes they sustain. Moreover, as the economy of Kiteezi Landfill makes apparent, waste frontiers have themselves become frontiers for salvaging other kinds of resources, as capitalism's surplus humanity ekes out a precarious living on the refuse of urban life.

Kampala's waste frontier follows the blurry line between land and water, transforming the unstable grounds where wetlands meet hillsides. Circling above on sunny afternoons, marabou storks signal the presence of the waste frontier in dumpsites where they scavenge for carrion and rotting fruit. A series of such dump sites occupy the edges of Kabalagala, a high-density, multiethnic, low-income, and predominantly low-rise neighborhood a 20-minute walk from the city's main industrial area. A swampy stream runs between Kabalagala and Nsambya and into the Nakivubo Channel, one of the main drains that empties Kampala's rainwater, sewage, municipal, and industrial wastes into Lake Victoria. Nsambya is a more prosperous hill, home to one of Kampala's oldest hospitals, the US embassy, a shiny new mall, and a sprawling set of barracks belonging to the police. For many tenants in Kabalagala, the exact ownership of the land they inhabit is unclear, even if their landlords are known to them. This is due to a complex system of institutional and individual ownership of land that has been accumulating new layers and modes of legalized land tenure since the first treaty was signed between the Buganda Kingdom and the British Protectorate government in 1900.[10] The British Crown claimed ownership over Buganda's wetlands, categorizing them as wastelands (along with forest and other uncultivated lands); individual title was not granted in these areas. While this de jure established colonial control over wetlands, in practice they remained largely unprotected and accessible for customary usage, de facto property of nobody and everybody (Ntambirweki 1998). At independence in 1962, the government of Uganda took over these rights and established further claim to their water resources. The borders of these lands have never been clear. Individual land titles have been granted to well-connected investors seeking to build industries and real estate developments in central but swampy Kampala locations. Adding to the confusion, in 2014 the government decreed that all land titles on gazette wetlands should be recalled, a policy that has been unevenly and only sporadically enforced.[11] The police own the land around the stream and wetland but have not consistently enforced their claim to it on the Kabalagala side. These liminal spaces have been gradually claimed and encroached upon by new residents who build houses and rent them out, acquiring insecure tenure through occupation, even as building in wetlands remains both illegal and precarious, vulnerable to both eviction and flooding.

Garbage has been vital to the transformation of this landscape and the unstable forms of property, residence, business, and terra-formation that constitute it. As is typical in Kampala, many of the houses in Kabalagala were constructed from homemade bricks made from clay harvested from along the wetlands. According to long-term residents, by the mid-1990s the edges of the swamp were pockmarked with holes where clay had been dug out and punctuated by kilns where bricks were baked before being used to build homes on higher ground. Unregulated private waste collection companies serving nearby areas began to use these holes to empty their trucks, gradually filling in the swamp with trash. These dump sites now serve the residents of Kabalagala and make visible the diversity of economies and ecologies that emerge at the waste frontier.

I first encountered these dump sites with Kato Mubiru, a councillor representing Kabalagala Parish, who earned the nickname *kasasiro* (garbage) for his dedication to improving waste management. A lifelong resident of Kabalagala and former employee of one of Uganda's oldest waste collection companies, Kato approached the waste stream with an entrepreneurial eye, seeing opportunities for youth development projects he could bring to his constituents. Kato brought me to the wetland edges to show me the history of waste management in his community written into the landscape. Standing on the dumps and looking uphill, he pointed out the steep and eroding slope with one-room houses precariously balanced on crumbing foundations. Heavy rains washed away the surface cover and revealed the texture of the earth below, a combination of clay soils and plastic bags, dropped as litter and over time buried, compressed with soil, and now seeming to ooze out of the hillside. The ground beneath our feet was flat and porous, with water seeping up underfoot as we followed a path along the edges of the dump sites.

Kato explained that while he made an effort to bring a municipal trash truck to Kabalagala every weekend, he could not serve every street every week, so residents had to wait up to 3 weeks for service. Kato encouraged residents to store waste at home, to sort it, and keep it dry to prevent rotting—but this was not always possible. Between visits from the trash trucks, residents found their own way to waste frontiers, improvising waste management by dumping domestic waste by the swamp or burning it on the roadside. As at Kiteezi, marabou storks in Kabalagala scavenged for food alongside salvagers searching for plastic bottles and bags, metal, and other salable scrap mixed into the waste. Younger and less organized than the workers salvaging at the municipal landfill, they nonetheless searched the waste frontier for resources, performing the labor of translating negative value into rent, meals, and school fees. Salvagers here collected plastics in small amounts and cleaned them in the swamp to fetch a higher price at the nearby kiosks where middlemen gathered the larger volumes that attract the serious buyers with connections to plastic manufacturers as near as the industrial area or as far as China. These para-sites, driven

10. The Uganda Agreement of 1900 founded the Uganda Protectorate and initiated a dualistic land regime legalizing both customary and freehold forms of tenure. The agreement divided the lands of the Buganda Kingdom between the Kabaka, his chiefs, missionary societies, and the British crown (Hanson 2003).

11. "Government cancels all land titles on wetlands," *Daily Monitor*, March 4, 2014.

by the demand for scrap metal in particular, have radically reduced the quantity of metal arriving at Kiteezi Landfill (Komakech et al. 2014). Clearing plastics from the waste stream, Kato explained, protects the wetlands and keeps them flowing, protecting the rest of the city from more flooding. Even so, he imagined the wetland continuing to disappear under the tide of trash. Pointing to an under-construction home, surrounded by deep trenches to protect it from the water, he recounted, "Here all was garbage, there were holes here, and they were dumping dumping dumping then compacting and compacting. What they do is fill [the swamp] with garbage, then cover with soil until it is firm, and then they can build."

As these houses go up, Kato tries to prevent more dumping nearby to keep the residents healthy: "People don't know how to sort their garbage. They put feces, they put condoms, they put everything there so when rain comes, you know these people are suffering a lot. That's why we stopped them from dumping this side. They are dumping on the other side now." The waste frontier closes and moves on, making way for homes and hygiene. These are early frontier settlers looking for the cheapest places to build, soon to be replaced, Kato confidently predicted, by businesses and bigger developers. Looking up toward the shopping centers looming over us in Nsambya, he imagined that "in the coming years you'll find this place and they have already built big houses, they'll dump more and start building and then some people will start to say this land is mine mine mine," anticipating future conflicts around ownership and construction on the emergent land (fig. 3).

The waste landscape sustains a variety of livelihoods that connect in different ways with the city's formal economy, extending waste infrastructure beyond the confines of the municipal government and opening the waste frontier to multiple participants. Taking out the trash was a promising business for unemployed young men (Buyana and Lwasa 2011). As in many of the poorest parts of Kampala, residents could dispose of their waste by giving a 500-shilling coin (US$0.20) to an informal waste collector. These informal collectors, known in Kabalagala as "carriers," circulate through low-income neighborhoods, charging to pick up trash sacks and take them away from homes and businesses using wheelbarrows or modified bicycles. Kato introduced me to Yusuf Miiro, a carrier who had been working in Kabalagala for 3 years, earning up to 30,000 UGX (US$12) daily, despite regularly having to bribe his way out of police custody. The KCCA opposes this form of collection and tries to arrest and fine informal collectors, impounding their meager tools. These were the only entrepreneurs who had successfully constructed a functioning "cost-recovery" waste collection service in the city's poorest areas—a task beyond the best-laid plans of World Bank urban experts. Nonetheless, they were seen as polluting the city's aesthetics, contributing to wetland degradation (if they dumped their collections in wetlands), and taking advantage of municipal services (if they dumped at known KCCA collection points). Rather than criminalizing this work, Kato envisioned linking it up with the official waste stream, constructing easily accessible "garbage banks" where informal collectors could dump trash for the KCCA to collect on a regular basis, as opposed to the wetland dump site that was all but inaccessible to trash trucks. Because it entailed more points of contact between the population and waste, this vision—one akin to projects successfully completed by waste pickers in, among other places, Ethiopia, India, and Brazil (Baudouin et al. 2010; Dias 2016)—ran counter to the image of the hermetically

Figure 3. Marabou storks feeding at the waste frontier, wetland dump sites in low-lying parts of Kampala. (Photos by Jacob Doherty.)

sealed official waste stream, the simplifying ideal through which planners came to see informal waste collectors as "dirtying the place," in the words of one municipal worker.

Storks and carriers thus find themselves in a shared predicament. Storks are not only rendered as waste like certain populations. The same set of material technologies, infrastructural transformations, processes of commodification, modes of authority, and visions of the urban future enact Kampala's ecologies of displacement and disposability across multiple species. State-centric views of infrastructure make no space for informal and animal infrastructures, instead seeking foreign direct investment and creating new markets for private waste collectors to operate. This view of the fully controlled, licensed, and authorized waste stream free from para-sites renders both people and animals disposable, even as they provide essential but unrecognized urban services that underpin city life in postcolonial Kampala.

## Modernizing the Urban Bestiary

Making a new Kampala entails remaking not only the city's government, economy, and infrastructure, as if that weren't enough. The transformation of the city also entails dramatic changes in the urban bestiary, remaking species belonging in the city by purifying its species composition (Tsing, Mathews, and Bubandt 2019). This effort is part of the project of establishing and maintaining the distinction between the city and the country, between rural agriculture and urban consumption. Reporting on the year 2012–2013, the minister for Kampala reported that the municipal government had exterminated 800 dogs and collected 14 million shillings (US$5,600) in fees from impounding 1,600 head of cattle and 900 goats and sheep.[12] Increasingly, animals' presence as living beings and bodies in Kampala is policed and barred, especially when outside the category of pet, while feeding the city relies on animals' continued presence as flesh.[13] Small herds of cattle walking the periphery, a common site when I first spent time in Kampala in 2010, were chased out of the city by 2014, while trucks packed full continued to ferry animals to the city's abattoir, itself facing imminent relocation, to more fully redraw the geography of animal bodies and flesh.

The biopolitics of the new Kampala is predicated on management of more-than-human forms of life. Animals' lives are sustained insofar as they sustain human lives; they are welcomed and encouraged within the confines of property relations and with stable futures as flesh for human consumption. The KCCA evaluates animals' presence through the rubrics of biosecurity and aesthetic cleanliness, figuring animals both as vectors of disease and evidence of incomplete modernity. This biopolitical transformation not only changes the animal order of the city but participates in expanding the commodification of everyday life, as more and more foodstuffs must be purchased on the market rather than produced at home. This enhances the common ambivalence toward urban life expressed by one interlocutor in the informal recycling business: "In my village everything is free, but in Kampala you must ever spend money to eat!"

As Clapperton Mavhunga (2011) has argued of colonial constructions of multispecies belonging, pestilence is unwanted mobility. While the new animal order in Kampala restricts the presence of wide-ranging animals like cattle and goats, the KCCA is encouraging small-scale projects for confined animals such as pigs and chickens, distributing chicks and piglets to women and youth in city slums as an income-earning entrepreneurial opportunity. With chicks and piglets reared to sell to markets and restaurants, these urban farming initiatives blur the country-city distinction but continue to enact living animals as immobile flesh rather than mobile bodies.[14] Storks' mobility is critical for understanding how they become pollution. Storks flout the norms regulating human movement through Kampala's environment. As comedian Ernest Bazanye observes in his weekly column: "Marabou storks just stroll cockily over whatever lawn they please,"[15] referring to the KCCA's draconian policing of grassy road medians downtown.

Kampala is a highly fragmented city, with clear lines drawn between the clean green spaces of elite recreation and domestic reproduction—leafy suburban homes, golf courses, hotel gardens, college campuses, and downtown parks—on the one hand, and on the other, the geographies of disposal where surplus matter and surplus populations commingle to the abhorrence of municipal reformers. These lines are often drawn by altitude, the hilly city's high ground claimed by prestigious institutions and wealthy residences, while the swampy, low-lying wetlands are left for slums and dump sites. This topography shapes the practices of disposal in the city. Waste flows downhill, accruing in drains, homes, and bodies, para-sites constituted as the city's sinks—reservoirs that immobilize pollutants, removing them from broader ecologies. Storks' movements transgress this spatial order. Storks make their homes in colonies in the clean, green treetops of the city's hillsides, waking early to feast on the city's filth, spending their mornings strutting through landfills, wetland dumps, abattoir excretions, and municipal backlogs looking for food before spending afternoons soaring above the city. They perch on trees and rooftops, speckling the ground with fecal reminders of their presence, inverting the downward flow of filth and redrawing the geography of sink and spill in the city. In this way, storks are a classic example of polluting matter out of place, transgressing simultaneously symbolic and material socio-spatial categories as

12. "Ministerial policy statement for financial year 2012–13," Kampala Capital City Authority, 2012. http://www.kcca.go.ug/uploads/Ministerial_Policy_Statement_For_FY_2012-13.pdf (accessed December 20, 2016).

13. This distinction between body and flesh draws on Hortense Spillers (1987).

14. I use "enact" here, following Annemarie Mol (2002), as an alternative to "construct" in order to emphasize the ontological consequences of these legal frames.

15. "Who killed Kaloli?" *New Vision*, July 23, 2013.

they move across and between the patches that constitute Kampala's landscape.

While storks benefit from the increasing availability of waste as the city expands, urban development threatens their habitat insofar as their preferred roosting sites in trees make way for housing, businesses, and urban infrastructures. Power lines, for example, both offer new locations to roost and pose a threat to birds, especially large birds like marabou storks, who risk collision and electrocution, sometimes causing power outages in the area (Kibuule and Pomeroy 2015). In 2007 the Kampala city council provoked environmentalists by chopping down trees to make way for power lines, leaving stork chicks to die on Kampala Road. The carcasses I saw at Makerere were also part of this ongoing struggle. University groundskeepers—residents of the campus who told me that they detest the birds because they spoil their drying laundry and disrupt their outdoor food preparation by scavenging foods left out to dry—left poisoned food out to retaliate. In this case, the groundskeepers acted without administrative authority, but the university itself has targeted the birds by cutting down trees and destroying nests at critical junctures of the storks' reproductive cycle. In 2014, Makerere University planned to cut down trees it deemed to have "out-lived their usefulness,"[16] a move that the organization Nature Uganda, an environmental NGO focusing on Uganda's birds, objected to on the grounds that it was clearly aimed at displacing the marabou stork from campus. Using the rhetoric of animal rights, Nature Uganda argues that, to eliminate the marabou stork from Kampala, the only humane strategy would be to solve the city's garbage problems. But humane for whom? The violent simplification of the city's waste stream would not only displace storks but also transform the landscapes and livelihoods of para-sites.

## Conclusion

Although there is no such place as "away," a lot is happening there anyway. Accounting for life at the waste frontier shows that disposability is a fantasy, that disposable informal and animal infrastructures not only endure but flourish and sustain the formal flows of waste, be it methane harvesting, transnational flows of recyclable scrap, or the supplements to the meager wages of municipal workers. Rather than romanticizing the endurance of animal infrastructures, it remains critical to ask what worlds they sustain and make possible, what regulatory norms support and undermine them, how they distribute power and precarity, what role they play in the reproduction of infrastructural violence, and what solidarities they engender across differences of all sorts, including species.

Far from unequivocally benign, these kinds of para-sites include debilitating subsidies such as toxic body burdens and other hazardous externalities. "Away" too often takes place in bodies, as Vanessa Agard-Jones (2014) and Kate Brown (2019) make clear. Para-sites entail frequent exposure to the hazards of the waste stream. These moments of exposure are typical of what Rob Nixon calls slow violence, "calamities that patiently dispense their devastation while remaining outside our flickering attention spans" (2011:6). Despite the social, medical, and economic tolls they take, they do not attract the same levels of care or attention as more eventful disasters. This is particularly the case in Africa, where epidemics and outbreaks have occupied the medical imagination at the expense of longer-term forms of injury such as the continent's invisible cancer epidemic (Livingston 2012). As elsewhere, in Kampala slow violence is infrastructural. Para-sites expose residents and workers to dioxins and particulate matter in the smoke of burning rubbish that can lead to cancer, asthma, and heart disease. They expose people to lead and other heavy metals in water sources near dumping sites, as well as to *Helicobacter pylori*, common bacteria found in organic waste that can cause ulcers and stomach cancer. Urban farming at para-sites pushes the waste frontier into plant and human bodies as wetland crops accrue heavy metals from industrial effluents and car exhaust. Likewise, marabou storks' bodies accumulate mercury and organochloride compounds from trash burning, vehicle exhaust, mosquito control, cotton farming, and industrial pollution that seeps into their air, water, and diet (Hollamby et al. 2004). It remains to be seen what politics might emerge from these co-contaminations. As it stands, these public health threats are what the normative waste stream is intended to guard against, concentrating away in as few sites as possible to minimize risk, but giving little attention to the everyday exposures that sustain the flow of waste through the city. Salvagers and informal waste collectors nonetheless immerse themselves in the hazards of the para-site. That they recognize these risks, and are willing to take them on, speaks to the multiple forms of slow and infrastructural violence that constitute para-sites.

In the context of ongoing displacement, however, vulnerability to infrastructural violence is translated not into a need for social protection or multispecies care but into another reason for disposability, as the poor are framed not so much as vulnerable but as always already diseased, contagious, and in need of containment or removal. Vulnerability, in this economy of attention, begets the violence of state simplification. Storks, salvagers, and other para-sites add complexity to the urban social and infrastructural order. The municipality has variously tried to incorporate and expel this complexity, violently simplifying the city's waste infrastructures. On the one hand, at Kiteezi Landfill, and with the variety of recycling kiosks within the city itself, it has tentatively established relations of nonrecognition with salvagers, tacitly allowing them to break municipal ordinances and puncture the waste stream that official policy sought to seal. In the city proper, on the other hand, it acts to expel para-sites, criminalizing informal waste collectors and arresting residents availing themselves of unauthorized dump sites. In doing so, the government was itself engaged in the world-making work of cleaning, defining, and enforcing aesthetic, environmental, and sanitary categories in ways that

16. "Conservationists battle Makerere University over dirty birds," *New Vision*, July 24, 2014.

enact specific norms and practices of citizenship and urban belonging. Ecological and sanitary differences are used to justify and necessitate continued displacement and disposability of humans and animals. Regulating informal and animal infrastructures, the municipality seeks control over the location and movement of the waste frontier to monopolize the means of infrastructural violence. Despite the valued services they provide in Kampala's low-income neighborhoods, para-sites are thus rendered disposable as a form of pollution. They do not, however, go away.

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